National Institute of Environmental Health Sciences

The consequences of climate change at an avian influenza 'hotspot'

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Abstract:

Avian influenza viruses (AIVs) pose significant danger to human health. A key step in managing this threat is understanding the maintenance of AIVs in wild birds, their natural reservoir. Ruddy turnstones (Arenaria interpres) are an atypical bird species in this regard, annually experiencing high AIV prevalence in only one location-Delaware Bay, USA, during their spring migration. While there, they congregate on beaches, attracted by the super-abundance of horseshoe crab eggs. A relationship between ruddy turnstone and horseshoe crab (Limulus polyphemus) population sizes has been established, with a declining horseshoe crab population linked to a corresponding drop in ruddy turnstone population sizes. The effect of this interaction on AIV prevalence in ruddy turnstones has also been addressed. Here, we employ a transmission model to investigate how the interaction between these two species is likely to be altered by climate change. We explore the consequences of this modified interaction on both ruddy turnstone population size and AIV prevalence and show that, if climate change leads to a large enough mismatch in species phenology, AIV prevalence in ruddy turnstones will increase even as their population size decreases.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3497130

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Other Exposure

Other Exposure: water temperature

Geographic Feature:

resource focuses on specific type of geography

Ocean/Coastal

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Zoonotic Disease

Zoonotic Disease: Other Zoonotic Disease

Zoonotic Disease (other): Avian influenza

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article, Research Article

Timescale: ☑

time period studied

Short-Term (

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content